Comments for: **Docket # 99-325 - HD-radio standard by iBiquity**

Dear sirs,

To begin with, I have no personal relationship with any broadcast entity, nor am I affiliated with any manufacturer or marketer of broadcasting or receiving equipment. I am a private radio-listening citizen of the United States of America. Therefore, I am making a relatively unbiased judgement on this topic.

These comments relate to he adopted digital HD-radio standard developed by iBiquity, and pertain solely to use of HD-radio on the AM broadcast spectrum 530-1710 kHz. The HD-radio standard developed by iBiquity currently being implemented, referred to as iBOC henceforth, has serious coverage and interference issues that appear to be routinely overlooked.

AM-band iBOC HD-radio creates sideband interference grossly in excess of what the NRSC analog standards sought to reduce or eliminate. Signals on two adjacent channels below, and more noticeably, two above, are badly afflicted by a "whizzing" type heterodyne, even if the iBOC station is below "city-grade" signal strength. If that station were also digital, the stream of both stations would potentially be adversely affected by those two stations being two channels apart. Even worse would be the interference between two digital stations one channel apart, such as during nighttime skywave propagation.

Here are real-life examples of this type of interference currently being noted at my location in Thousand Oaks, CA. All stations mentioned by call letters were formerly readily-discernable in standard analog mode without a digital carrier present.

KMJ 580 - creates additional obliteration of KTIE 590, some background hash on 570 KLAC, and a slight "whizzing" heterodyne on KOGO 600 . KMJ is nearly 200 miles from here, by the way!

KOGO 600 - obliterates KAVL 610 and KTIE 590, and creates a "whizzing" heterodyne on KIGS 620 and on KMJ 580. KTIE listeners in their primary San Bernardino service area report objectionable hash-like interference within the station's primary contour.

KFI 640 (prior to their tragic antenna collapse and reversion to their backup antenna and transmitter last January) - "whizzing" on KGDP 660 and on KIGS 620. 630 and 650 obliterated.

KMXE 830 - severe obliteration from 810-850. At 820 kHz, a traveler's information station operates in Los Angeles for the Hollywood Bowl. This TIS is no longer audible beyond 1/2 mile from their transmitter in Hollywood. At 810 kHz, a traveler's information station operates in Los Angeles for the University of Southern California. That station now receives a strong "whizzing" heterodyne. Evening regular KXTA 840 is obliterated, and KOA 850 plus KGO 810 receive strong "whizzing" heterodynes until KMXE shuts off their iBOC exciter for the night.

KTNQ - Total obliteration of KCHJ 1010 and KJDJ 1030. KURS 1040 now receives a "whizzing" heterodyne, as does KCEO 1000. People report interference even in and around San Diego for these two stations, their primary service areas.

KNX 1070 - strong "whizzing" on KMAP 1050 Frazier Park and KCAA 1050 Loma Linda, right into their primary service areas. Obliteration of 1060 and 1080 occurs. A strong "whizzing" heterodyne on city-grade XEPRS 1090, whose primary service area targets Los Angeles and San Diego, is also present, and is noticeable right into San Diego County.

KDIS 1110 - Causes additional interference to XEPRS 1090. KAFY 1100 from Bakersfield is obliterated. 1120 is obliterated. KSDO 1130 from San Diego receives strong "whizzing", right into their primary coverage area in San Diego County.

These seven above-mentioned iBOC HD-radio AM stations receivable in my area have caused :

-Seven otherwise readily-discernable stations to completely disappear from useable reception on the AM band,

-Fourteen stations are now afflicted by objectionable interference,

-TWENT-EIGHT AM broadcast channels have incurred marked interference to their noise floor - this is 24% of the entire AM band - nearly a QUARTER of the AM broadcast band now suffers some type of interference from just these seven iBOC stations alone! Imagine if ALL AM stations converted and went to iBOC HD 24 hours a day!

Nighttime use of the iBOC system will create unacceptable levels of hash-like interference, rendering the band a useless service unless you are very close to a station's transmitter. Fading and co-channel signals will also preclude viable use of the standard.

An air-traffic safety issue exists from iBOC stations operating on 530, 540, or 550 kHz. Digital sidebands from these stations can potentially interfere with non-directional aeronautical navigation radiobeacons (NDBs) operating between 510 and 529 kHz, which are used for on-approach alignment. The aircraft's automatic direction-finding (ADF) unit may fail to correctly function in the presence of a strong iBOC HD sideband, thus causing a potential navigation hazard and safety threat to air traffic using those navigation aids, especially during IFR (instrument-only) conditions.

The iBOC HD-radio standard for AM also has serious coverage issues. You have to have a very strong city-grade signal to consistently and reliably use it in digital mode. Also, stations cannot modulate their analog portions at up to 125% like possible with good old-fashioned analog C-QuAM AM stereo. Consequently, coverage of the analog will also be less, and with narrow, muddy sound quality and an ever-present buzzing background hash. Fewer listeners will be reliably reached either in analog or digital.

This is not servicing the public interest, and is a step backward. Those who tune in to stations from bad signal areas, such as office buildings or rural and suburban areas, will suffer greatest.

Coverage loss and interference due to iBOC HD radio presents a public safety issue. Weather and national security warnings may not be receivable to a public relying upon stations to provide them, particularly in bad-reception areas where a formerly fully-modulated analog signal once could reach, or was not interfered with by an iBOC station.

Advertisers doing business with broadcasters are sure to see a decrease in their potential as well, since a smaller portion of the coverage area will reliably be able to receive the station's signal. AM iBOC HD-radio is bad for the advertising business.

Additionally, iBOC digital has spurred the practice of stations intentionally degrading their audio quality outside of the use of digital operation by leaving their bandwidth brick-walled at 5kHz around the clock. Even stations that have not implemented iBOC HD-radio (like those of Clear Channel Corporation) have brick-walled their audio 24 hours to 5 or 6 kHz. This causes an analog splatter that is very annoying - a "creaking" or loud "chirping", which is much more destructive than the splatter from stations using a standard NRSC curve. Stations that are iBOC HD should be required to return to NRSC bandwidth at night to prevent this phenomenon, as should any non-digital using similar masks. The narrow brick-wall bandwidth mask should ONLY be used to keep the digital signal intact DURING DIGITAL TRANSMISSION. Extraneous use of it should not be allowed, in order to prevent "chirping" splatter, and to let users hear the audio more clearly. Purposeful degradation of audio quality is not in the public interest, as it is harder to hear for some people.

Just as when the Federal Communications Commission took the badly-failed "marketplace" approach to selection and implementation of an analog AM stereo standard during the 1980s and early 1990's, there again seems to be little urgency displayed by receiver manufacturers to add the new digital decoding capability to radios. Even though there are seven AM HD-radio stations on the air in my area, I cannot go out to any retail store at this time and buy a radio to receive them in HD. If I could, it would cost me several hundred dollars. That is because few receiver manufacturers are willing adopting it because they are not mandated to add the capability, and the price is high for the few that do, as iBiquity can keep charging very high license royalties for it, further slowing its adoption. Had there been a mandate in the early 1980s to require analog stereo for both AM and FM in all stereo-type receivers, we wouldn't have such a widespread audio quality issue with AM broadcasting, and such an urgency now to suddenly move to digital as fast as possible. The move now is so fast that no receivers yet exist at brick-and-mortar stores like RadioShack, Best Buy, Circuit City, WalMart, and the like, for the general public to simply walk in and purchase at a reasonable and affordable price.

I urge you to equally consider Cam-D as an alternative HD-radio consideration- a more stable digital standard developed by Leonard Kahn and is currently in testing. Cam-D provides stability during nighttime fading, allows stereo on both the digital and analog portions of the signal, and most importantly, does not create sideband interference at the horrendous levels that the currently-prolific iBOC system has associated with it.

My urgency for the Commission is to either consider an alternative digital system that is less-flawed (such as Cam-D), or to enhance and provide incentives for stations to return to analog AM stereo broadcasting (and allow **both** the C-QuAM **and** ISB systems for different signal and time of day situations), and to re-allocate stations to allow for greater bandwidth and fewer nighttime co-channel problems. Implementing iBOC HD-radio is just an ultimate step backward from an AM broadcast band that was functioning just fine to begin with and serving its listening audience with a fair amount of interference-free service. An easier fix, such as mandating both analog AM stereo standards in all radios would have been far easier and cost-effective for the broadcasting industry, for manufacturers of radios, and would be far more supportive of the public interest than forcing unproven and flawed digital HD-radio technology upon them.

-Darwin Long
604 E. Avenida de los Arboles
Thousand Oaks, CA 91360-4751
(805) 492-9999